Claims

1. A peptide-type compound or variant thereof having immunomodulating activity including the N-terminal acylated and/or C-terminal amidated or esterified forms thereof of up to 60 amino acids wherein said peptide-type compound comprises the formula:

$$\alpha\text{-}\beta$$

wherein:

α and β are the same or different and are of the formula:

(a) $\{R\ aa^{76\text{-}77}\ L\}\ (aa^{79\text{-}84})$

or

(b) $(aa^{84\text{-}79})\ \{L\ aa^{77\text{-}76}\ R\}$

wherein:

aa^{76} is E or V;

aa^{77} is D, S or N;

aa^{79} is R or G;

aa^{80} is I or N;

aa^{81} is a hydrophobic or small amino acid;

aa^{82} is R or L;

aa^{83} is G or R;

aa^{84} is a hydrophobic or small amino acid;

wherein

the sequence in the brackets may optionally be absent or truncated at any peptide type bond within the brackets.

2. The compound of claim 1 wherein aa^{80} is I.

3. The compound of claim 1 wherein at least one of the amino acids is the D-isomer.

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4. The compound of claim 3 wherein all of the amino acids are the D-isomer.

5. The compound of claim 1 wherein α is (a) and β is (a).

6. The compound of claim 1 wherein α is (b) and β is (b).

7. The compound of claim 1 wherein α is (b) and β is (a).

8. The compound of claim 1 wherein α is (a) and β is (b).

9. The compound of claim 1 wherein aa^{76} is E.

10. The compound of claim 1 wherein aa^{79} is R.

11. The compound of claim 1 wherein aa^{81} is A or L.

12. The compound of claim 1 wherein aa^{82} is L.

13. The compound of claim 1 wherein aa^{83} is R.

14. The compound of claim 1 wherein aa^{84} is Y.

15. The compound of claim 1 wherein each of α and β independently comprises RIALRY, YRLAIR, RILLRY or YRLLIR.

16. The compound of claim 1 which is YRLAIRLNERRENLRIALRY or YRLAIRLNERYRLAIRLNER.

17. The compound of claim 1 which is YRLAIRRIALRY .

18. A method for extending the period of acceptance by a recipient of a transplant from an MHC unmatched donor, said method comprising:

administering to said donor in accordance with a predetermined regimen, in an amount effective to extend the period of acceptance of said transplant, the compound of claim 1;

whereby the period of acceptance of said transplant is extended.

19. The method of claim 18, wherein said compound is administered in combination with a subtherapeutic dosage of an immunosuppressant, and said period of acceptance is extended as compared to the period which would have resulted from the administering of the immunosuppressant as said subtherapeutic dosage in the absence of said compound.

20. A composition comprising the compound of claim 1 and a subtherapeutic dosage of an immunosuppressant, together in an amount sufficient to inhibit transplant rejection in a mammal, in a physiologically acceptable medium.

21. The peptide-type compound of claim 1 which is a peptide and wherein all the amino acid residues in said peptide are gene-encoded.

22. A DNA molecule comprising a nucleotide sequence that encodes the peptide of claim 21.

23. A DNA molecule which comprises an expression system for the production of the peptide of claim 21 when said DNA molecule is contained in a host cell.

24. A recombinant host cell which is modified to contain the DNA molecule of claim 23.

25. A method to prepare the peptide of claim 21 which method comprises culturing a recombinant host cell containing a DNA molecule which comprises an expression system for the production of said peptide under conditions wherein said peptide is produced; and recovering the peptide from the culture.

26. Antibodies specifically immunoreactive with the dimer of claim 1.